TECHNICAL MANUAL

RADIO RECEIVER R-737 ( ) /ARN
(SERVICE TEST MODELS)

OPERATION AND MAINTENANCE

DEFENSE ELECTRONIC PRODUCTS
RADIO CORPORATION OF AMERICA
Camden, New Jersey, U. S. A.

AUGUST, 1957

(PART I)

TECHNICAL MANUAL

also add note about new resistor

RADIO RECEIVER R-737( )/ARN

(SERVICE TEST MODELS)

OPERATOR'S MANUAL

change these numbers

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RADIO CORPORATION OF AMERICA
DEFENSE ELECTRONIC PRODUCTS
CAMDEN, NEW JERSEY, U.S.A.

1957

(PART I)

TECHNICAL MANUAL

RADIO RECEIVER R-737( )/ARN

SERVICE TEST MODELS

OPERATOR'S MANUAL

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CHAPTER 1

INTRODUCTION

Section I. GENERAL

1. Scope

a. These instructions contain description and information on the installation, operation, and operator's maintenance of service test model of Radio Receiver R-737( )/ARN. The complete manual includes one other part as follows:

Radio Receiver R-737( )/ARN, Maintenance Manual

Section II. DESCRIPTION AND DATA

2. Purpose and Use

a. Radio Receiver R-737( )/ARN is a double-conversion superheterodyne aircraft marker beacon receiver providing both aural and visual signals. Light weight, small size and simplified power supply, in addition to the absence of relays, characterize this receiver.

3. Technical Characteristics

Operating Frequency	75 megacycles, crystal controlled
Sensitivity	500 microvolts to light indicator lamp and produce 12.5 milliwatts of audio into nominal 150-ohm load with 30% modulation of 400 to 3000 cycles per second; 10 db signal-plus-noise to noise minimum.
Bandwidth	80 kc at -6 db 300 kc at -60 db
Image Rejection	-60 db
Spurious Rejection	-60 db

AGC	No more than 6 db rise above 12.5 milliwatts threshold for 40 db increase in r-f signal.
Antenna Input Impedance	50 ohms nominal at 75 megacycles.
Sensitivity Control	Potentiometer, 10 db variation minimum.
Audio Gain Control	10 db variation minimum in four steps with 150-ohm load connected to audio output.
Power Requirements	42 milliamperes at nominal 27.5 volts dc, exclusive of the indicator lamp current.
Weight	16 ounces.

4. Components of Radio Receiver R-737( )/ARN Equipment

a. Components. The components of a Radio Receiver R-737( )/ARN installation are listed in the following table.

Quantity	Item	Height (in.)	Depth (in.)	Width (in.)	Unit Weight (lb.)
1	Radio Receiver R-737( )/ARN	1-3/4	5 3/8	3-7/8 5	1
1	Power Connector (P2) with Hood DE-9S	-	-	-	-
1	Coaxial Connector (P1) for antenna 1Pc 45000	-	-	-	-
1	Indicator Lamp Assembly SC-C17810-4 with Lamp (G.E. 1820)	-	-	-	-
1	Bulkhead mounting consisting of 1 top and 1 bottom	-	-	-	-
1	External Audio Attenuator Assembly	1-1/2	1	1-1/2	2 oz.

5. Description of Radio Receiver R-737( )/ARN

a. Radio Receiver R-737( )/ARN is a 75-megacycle, transistorized aircraft marker beacon receiver employing a crystal controlled dual conversion superheterodyne circuit. Included is a transistorized indicator switching circuit making a conventional relay unnecessary.

b. The receiver has a metal case 3 by 1.5 inches making a volume of 22.5 cubic inches. Receiver weight is 16 ounces. Mounting is by quarter-turn fasteners, two on each side of the 1.825 by 5.75-inch panel. Bulkhead or standard control panel rack mounting can be used.

c. Receiver controls are adjusted at time of installation and remain fixed. A sensitivity control and audio attenuator are the only operating controls, tuning must be completed before installation of the receiver. The sensitivity control may be located at any convenient point remote from the receiver. An attenuation control is located on the receiver but a remote attenuator switch can be used. A single light or/and a three-light indicator unit can be employed with the receiver.

d. All components are mounted on the reverse side of an etched wiring board and soldered in place. The diodes, except CR1, and thermistors are soldered in place while transistors are retained by sockets. The diode CR1 is mounted in clips.

6. System Application

a. Radio Receiver R-737( )/ARN is a marker beacon receiver designed for control rack or bulkhead mounting. The receiver can be located remotely from the operator but the indicator lamp, remote sensitivity control, and remote attenuator control if used, must be located within the operator's reach for in-flight testing. Upon reception of a marker beacon signal the indicator lamp is illuminated and a 400 to 3000-cycle tone is fed to the audio output circuit.

b. When combined with a three-light adapter as shown in the installation drawing, figure 1, a three-light indicator system is formed.

CHAPTER 2

INSTALLATION

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

7. Unpacking

a. Packaging Data.

The Radio Receiver R-737( )/ARN, because of its light weight and compactness, is shipped in a corrugated cardboard container. The various accessory items are conveniently grouped and packaged to prevent mechanical damage during shipment.

b. Removing Contents.

No tools are required to open the shipping container beyond a knife to cut paper seals. Remove the items from the outer container, strip off moisture barrier wrapping and extract items from individual packages. Retain packaging until all items have been checked.

8. Checking Unpacked Equipment

a. Inspect the items in the equipment for damage incurred during shipment. If equipment has been damaged, fill out and forward DD Form 6, Report of Damaged or improper shipment, as prescribed in AFR 71-4 (Air Force).

b. See that the equipment is complete as listed on the packing slip. If a packing slip is not available, check it against the table of components in paragraph 4.

9. Special Test Equipment Required for Adjustments at Installation

Tools and test equipment required for installation of Radio Receiver R-737( )/ARN are listed below. The use of each item is also listed.

1 each Signal Generator TS-497( )/U to provide input signal for receiver adjustment.

1 each Electronic Multimeter TS-505( )/U to check power supply voltages.

10. Installation of Radio Receiver R-737( )/ARN

a. Mount the Radio Receiver R-737( )/ARN mounting in the Control Rack or bulkhead as desired. When control rack mounting is used, place the

receiver panel against the rack in the proper position and turn the two screws on either side of the panel clockwise until they lock, only a quarter to half turn should be necessary.

b. For bulkhead mounting, first drill the mounting holes for the lower bracket and mount the bracket. Next place the receiver on the bracket and clamp it in place with the other bracket supplied.

11. Connections

a. Wire up the receiver, using the Installation Diagram, figure 1, as a guide. The remote sensitivity control and remote attenuator switch (not supplied) may or may not be used depending on the installation. Use the applicable adjustment procedure. Either or both single indicator light assembly or three-light adapter unit may be installed as required.

b. Before soldering the wires to the plug, slip the hood over the wires, solder the wires and mount the hood on the plug. Plug P2 into jack J2 and clamp with the clamp supplied. Attach the coaxial connector supplied to the 75-megacycle RG-58/U or equivalent 51-ohm antenna coaxial cable and attach to jack J1, the antenna jack. The installation is ready for adjustment.

CAUTION

The Indicator Light Assembly must be wired in respect to terminations and polarities as shown in the Installation Diagram, figure 1, or transistors Q11 and Q12 may be damaged when the indicator lamp is tested.

Section II. INITIAL ADJUSTMENT OF EQUIPMENT

12. Adjustment Without Remote Sensitivity Control. After installation has been completed and before operation is attempted make the following adjustments.

a. Turn on the power source and close switches or breakers to turn on receiver. Check that power source is operating under normal load and supplying 27.5 volts to the receiver.

b. Apply a 75-megacycle signal, modulated by 400 to 3000 cycles at 30 percent, to the antenna jack J1. Set the level between 500 and 1500 microvolts, as desired for the particular installation.

c. Turn the sensitivity control, R21 in the receiver, counterclockwise as far as it will go and then turn it clockwise until the lamp just lights.

d. Reduce the signal generator output until the lamp goes out.

e. Increase the 75-megacycle signal level until the lamp just comes on again. Check the signal generator level. If it is incorrect repeat steps c, d and e until the desired level is obtained.

f. Set the audio output attenuator, switch S1 (see figures 4 and 6) for the proper audio level. With the switch in the clockwise position the output will be 12 1/2 milliwatts into a 150-ohm load. This can be reduced by four 2.8-db steps to one milliwatt.

g. Remove signal generator cable from jack J1 and connect aircraft antenna. This completes the adjustments.

CAUTION

Proceed in the order given or proper results cannot be obtained.

13. Adjustment with Remote Sensitivity Control.

a. Move the switch on the remote sensitivity control to "LOW" position.

b. Proceed with the procedure given in paragraph 12 using a signal generator output of approximately 1200 to 1500 microvolts for the lower value of sensitivity and excepting step g.

c. Move the switch on the remote sensitivity control to "HI" position and set the signal generator output to a level between 500 and 750 microvolts.

d. Turn the sensitivity control counterclockwise as far as it will go and then turn it clockwise until the lamp just lights.

e. Reduce the signal generator output until the lamp goes out.

f. Increase the 75-megacycle signal level until the lamp just comes on again. Check the signal generator level. If it is incorrect, repeat steps d and e until the desired level is obtained.

g. Remove signal generator cable from jack J1 and connect aircraft antenna. This completes the adjustments.

CAUTION

Proceed in order given or proper results cannot be obtained.

CHAPTER 3

OPERATING INSTRUCTIONS

Section I. OPERATING TECHNIQUES

14. Operation

Radio Receiver R-737( )/ARN is a marker beacon receiver which requires no attention from the operator, except to be turned on previous to take off and off after the flight is completed. Adjustment of sensitivity remote from the receiver or audio attenuation adjustments are performed as necessary.

15. Preflight Testing

a. Indicator Test.

After power is switched onto the receiver, press in on the indicator lamp lens which will cause the indicator to light if the lamp is in operating condition.

b. Receiver Sensitivity Check.

Arrange a Signal Generator TS-497( )/U to provide a 75-megacycle signal, modulated 30 percent at 1000 cycles with output level at 1500 microvolts. Apply this signal to receiver input which should cause indicator lamp to light and audio tone in the output. Remove modulation, which will cause indicator to go off and tone to cease. This will complete the test for system functioning.

16. Reception Indication

Reception of signals from marker beacon transmissions will be indicated by the lamp lighting and an audible 400-to-3000-cycle tone being heard in the headphones. Audio attenuation may be controlled at the receiver or at a remote position. When remote control is used, the attenuator on the receiver must be set at maximum.

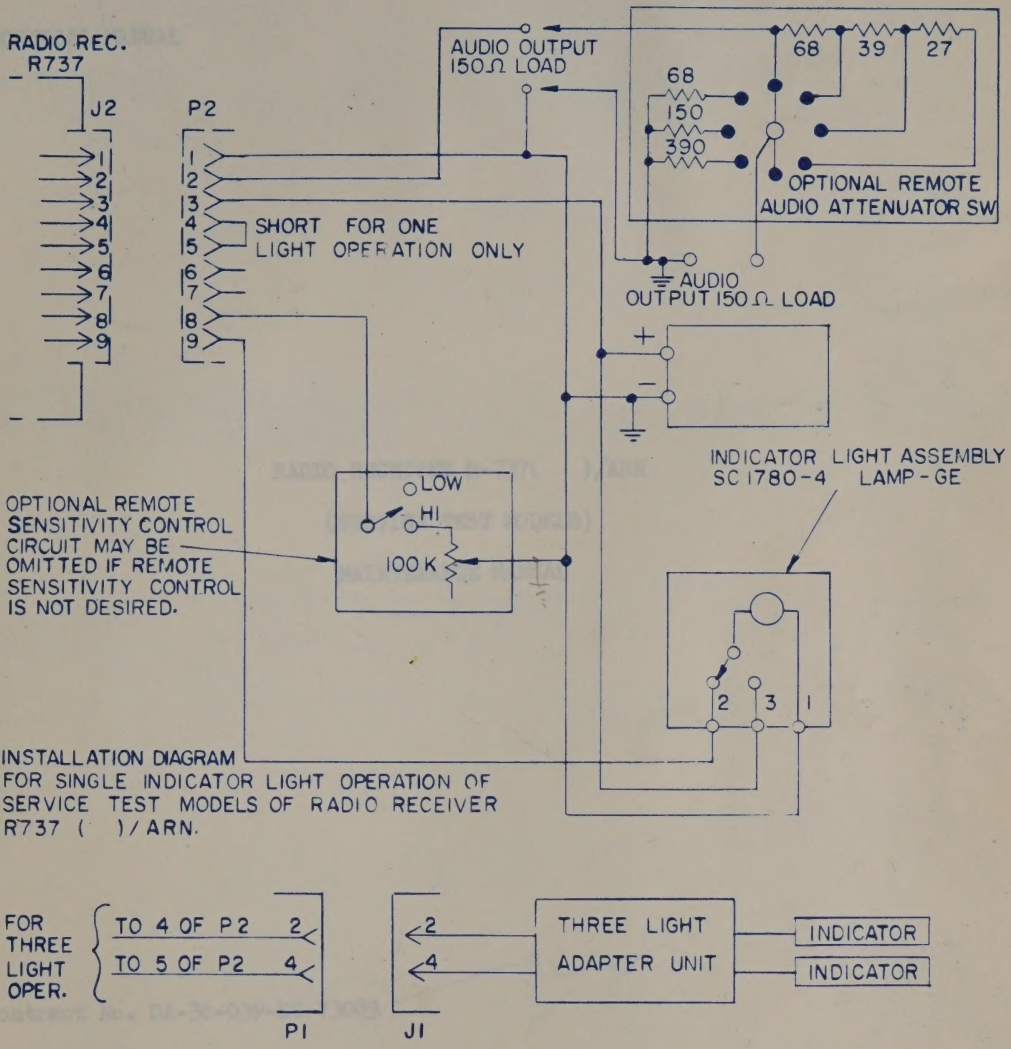
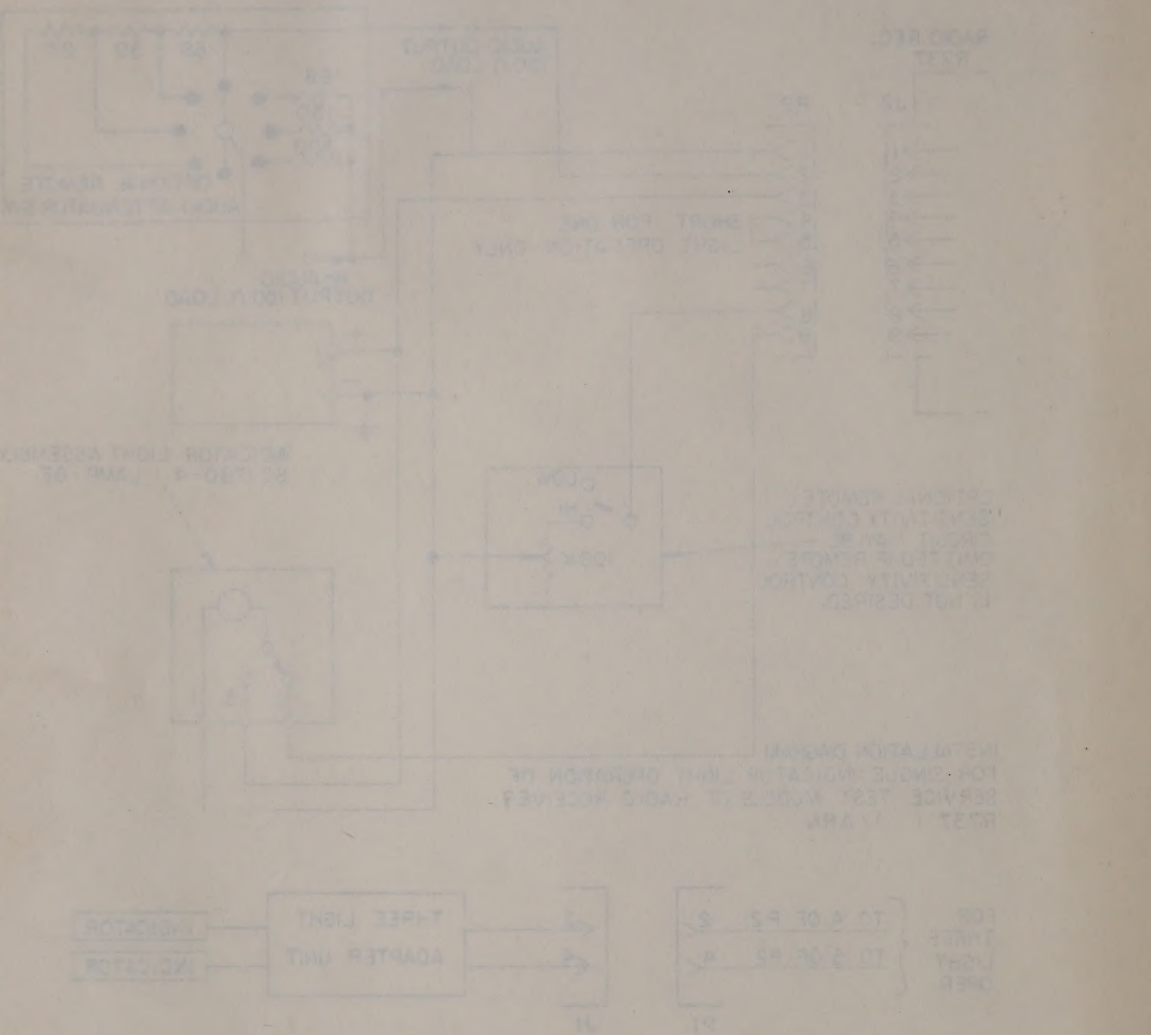


Figure 1. Installation diagram



(PART II)

TECHNICAL MANUAL

RADIO RECEIVER R-737( )/ARN

(SERVICE TEST MODELS)

MAINTENANCE MANUAL

Contract No. DA-36-039-SC-73083

Change

RADIO CORPORATION OF AMERICA
DEFENSE ELECTRONIC PRODUCTS
CAMDEN, NEW JERSEY, U.S.A.

1957

TECHNICAL MANUAL

RADIO RECEIVER R-737( )/ARN

SERVICE TEST MODELS

MAINTENANCE MANUAL

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(PART II)

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1. Scope

a. These instructions are published for the use of personnel responsible for the maintenance of Radio Receiver R-737( )/ARN. The complete technical manual for this equipment includes one other part as follows.

Radio Receiver R-737( )/ARN, Operator's Manual

b. The design of the unit is such as to allow for complete replacement at organization maintenance level with repairs and adjustments to be made at a fixed maintenance echelon.

c. This manual includes a description of circuit theory to assist maintenance personnel in analyzing and locating a defective circuit or part.

CHAPTER 2

THEORY

Section I. SYSTEM THEORY

2. General

The Radio Receiver R-737( )/ARN employs a double-conversion superheterodyne circuit for the reception of aircraft beacon signals. The circuits are fully transistorized and provide an audible note in a headset and a visual signal consisting of a lamp. Switching for the latter is accomplished without relays which results in a stable signal under all conditions of vibration or shock. Functioning of the various circuits is described in the following section. Refer to the schematic diagram, figure 4, as necessary to supplement the text.

Section II. CIRCUIT THEORY

3. Preselector

Transformers T1, T2, T3 and T4 make up the 75-megacycle front end preselector. These transformers make up single tuned, high end capacity coupled circuits of nearly critical coupling. Input filter inductor T1 is tapped to match a 50-ohm antenna (coupled through jack J1), and the output filter inductor T4 is tapped to match a 500-ohm input to the diode CR1.

4. High-Frequency Oscillator

The high-frequency oscillator, utilizing transistor Q1, crystal Y1, and transformer T8, is a grounded-base, tuned-collector circuit. A fifth overtone miniature quartz crystal Y1 and capacitor C15 form the feedback circuit from collector to emitter. Since the crystal has a low impedance at 70.8 megacycles, feedback occurs at this frequency. The 70.8 megacycles is used for conversion of the signal from 75 to 4.2 megacycles. Reactance L1 is used across crystal Y1 to cancel the effects of the crystal holder capacity which shunts Y1.

5. First Mixer

A low-noise diode CR1 is connected from the tap on the output filter inductor T4 to the high side of the coupling link on transformer T5, the 4.2-megacycle i-f input transformer. The low side of this link is connected to the high side of the coupling link of transformer T8. This simple arrangement provides all the necessary circuit couplings of r-f, first i-f, and first oscillator for first mixer operation.

6. First I-F Amplifier

Transformers T5, T6 and T7 are high end capacity coupled, single tuned near critically coupled circuits making up the first i-f tuned circuits. This group compares circuitwise and tuningwise to the preselector so as not to sacrifice receiver front end bandwidth, and reduces secondary image response approximately 80 db. The 4.2-megacycle first i-f signal is then fed into converter Q2.

7. Converter

The first i-f signal is coupled into the converter, consisting of transistor Q2 and its associated 4.72-megacycle crystal Y2. This stage acts as a mixer and a 4.72-megacycle oscillator to give a 520-kilocycle output for the second i-f. The 520-kilocycle filter, composed of T9, T10, T11, and coupling capacitors C19 and C20, serves as a collector impedance and the crystal, Y2, provides the feedback path to the base of the oscillator portion. Oscillator operation has base-input with a grounded emitter.

The emitter-base junction acts as a mixer with the overall circuit acting as an i-f amplifier giving about 20-db amplification.

8. Second I-F Amplifier

a. The converter output is fed to the second i-f filter, including transformers T9, T10, and T11, which passes the second i-f of 520 kilocycles with a high order of selectivity. Since the three tuned circuits are slightly overcoupled, a partial double-peaked response is obtained. Transistor Q2 collector resistance loading of transformer T9 as well as R8 and transistor Q3 input resistance loading of transformer T11 and R9 keep the peak-to-valley ratio small, resulting in a relatively flat response in the passband. The filter sets the second i-f bandpass and thus isolates the tuned circuits from the transistors Q3, Q4 and Q5, giving minimum selectivity variations with changes in signal level and service conditions.

b. The second i-f stages use grounded emitter circuits, allowing maximum gain and base-injection automatic gain control current which requires a minimum of agc power. Broad-banded i-f stages are used, so there will be no effect on receiver selectivity as the transistor input and output impedances change. Emitter resistance of all stages is made sufficiently large to provide both gain stability and d-c operating point stability under service conditions. Each emitter resistance is bypassed to operate only as a direct-current impedance. Broadband transformers T12, T13, and T14 resonate near 520 kilocycles with the transistor and circuit capacities and have a very broad peak response. As agc power is applied, this peak shifts upward in frequency due to lower reflected input and output capacities and resistance. The overall effect on selectivity is negligible due to the broad response. Gain is approximately 25 db per stage. Thermistor RT1 and resistor R25 are used to partially compensate for loss of i-f gain at elevated temperatures and with the input resistance of Q5 form a temperature sensitive voltage divider which adjusts the signal level at the input to Q5.

9. Sensitivity Control

Sensitivity control is accomplished by varying the signal level input to the second i-f amplifier transistor Q4. A resistance divider network consisting of R16 and CR2, which functions as a variable resistor, controls the i-f signal input to Q4. A direct current, adjusted by sensitivity control R21, controls the resistance value of CR2. The diode CR2 has a high value of resistance with low d-c current through it, while a low value of resistance with a high value of current. A current change up to a maximum of one milliampere is sufficient to give a sensitivity control range in excess of 10 db. This circuit has the advantage of controlling gain without varying the operating point of the transistor i-f amplifier. Resistors R57, R58, and R59 comprise a gain adjustment circuit which is normally set when the receiver is tested after assembly. One of the resistors is connected into the circuit by means of soldered links so that a minimum sensitivity of not less than 1500 microvolts nor more than 2000 microvolts is obtained.

10. Second Detector

The second detector diode, CR3, converts the 520 kc i-f signal to audio frequency with a direct-current component proportional to the i-f signal level. The audio component is fed to the first audio amplifier Q6 while the direct-current component is fed to the input of automatic gain control amplifier Q8 through CR4. Capacitors C34 and C26 filter out the audio components so that only an a-c signal is fed back to the first and second i-f amplifiers.

11. Automatic Gain Control

The silicon junction diode CR4 does not conduct readily until a voltage difference on the order of one-half volt exists across it. This effectively delays the automatic gain control action. The direct-current signal from the second detector is at a very low power level and must be amplified by transistor Q8 before it has sufficient power to control receiver gain. After direct-current amplification by the AGC amplifier Q8, the AGC signal is fed back to the bases of the first and second IF amplifier transistors Q3 and Q4. This current changes the base bias on Q3 and Q4 so that an increase in signal level causes the base current and resultant collector current of these two amplifiers to decrease which causes a decrease in stage gain. Automatic gain control must be applied to the first two stages of i-f amplification where the signal level is low so that changing the operating point does not cause signal clipping in the amplifier. The receiver circuits are so arranged that AGC action is delayed until after the normal audio output of 12.5 milliwatts is reached and the indicator light goes on.

12. Audio Amplifiers

a. Transistor Q6 functions as a first audio amplifier supplying audio gain following detection and drives the audio output amplifier transistor Q7. Capacity coupling between Q6 and Q7 is used to eliminate a coupling transformer. Resistors R37 and R38 comprises an impedance matching network between Q6 and Q7 which prevents the audio output stage from being over driven under strong signal reception.

b. The audio output amplifier, Q7, provides dual outputs by using an output transformer T15 with two secondary windings. One secondary provides 12.5 milliwatts or more of audio output to a 150-ohm load and the other secondary supplies audio power to the indicator light switch detector. The audio output of Q7 will start to clip at power levels of about 17 milliwatts. This clipping action tends to flatten the audio output above the point of 12.5 milliwatts where the indicator light goes on.

c. Both the first and second audio amplifiers are stabilized with temperature by virtue of the large resistance in series with their emitters. The audio output stage, Q7, is further stabilized by a-c current feedback due to the unbypassed emitter resistor R41.

d. An audio attenuator, S1, is used to set the power output level, or volume. An attenuator is used to maintain a constant load impedance on transistor Q7 when adjusting the volume level. If a constant load impedance is not maintained at the collector of Q7, the indicator light circuits will not operate properly.

13. Indicator Light Switching

a. The indicator light switching circuit which replaces the more conventional tube-relay circuit consists of diodes CR5, CR6 and transistors Q9 to Q12. This circuit switches the single light indicator, connected to pins 9 and 1 of J2, either on or off. It provides a closely controlled on-off differential and is insensitive to shock and vibration. Pins 4 and 5 of J2 provides for the connection of a three-light adapter unit when a three-light system is required.

b. Audio output from T15 is rectified by CR5 which in turn is directly coupled to the base or control element of transistor Q9. The latter is normally cut off and starts conducting when the rectifier voltage from CR5 exceeds the drop across R50. When the collector current in Q9 reaches a certain level, the collector voltage of Q10 will be raised to such a point that the collector current flow of Q10 will be interrupted. Current flow in Q10 is controlled by voltage supplied to the base from the collector of Q9 through divider network R51 and R53. The common emitter resistor R50 between Q9 and Q10 aids in this action, and Q10 collector current will then rapidly diminish. When the collector current of Q10 decreases, the voltage across R54 drops and causes the bases of final light switching transistors Q11 and Q12 to draw current. The collector current flow through Q11 and Q12 will light the indicator light.

c. The audio output level must be lowered to a point below the initial trigger threshold point before the process reverses itself, and represents the on-off differential. Summing up, diode CR5 and transistors Q9 and Q10 comprise a trigger and shaping circuit, while transistors Q11 and Q12, which are connected in parallel to obtain a current rating of 100 milliamperes, perform the actual switching operation.

d. Since transistor Q9 is a common switching circuit with practically no emitter stabilization resistance, an auxiliary temperature stabilization circuit must be provided. Thermistor RT2 and R49 provide a temperature sensitive base bias adjustment on Q9 which stabilizes the on threshold or trigger point. Operation of Q10, Q11, and Q12 are not affected by temperature other than a reverse bias must be provided when these transistors are in the non-conducting part of their cycle at high temperature. Resistor R50 provides emitter bias of a reverse direction. This limits the collector leakage current when Q10 is in the non-conducting phase and at high temperature. Diode CR6 represents a high resistance with low values of currents through it, while at high values (or load currents) it represents a low value of resistance. Thus CR6 keeps the emitters of Q11 and Q12 about one-half volt below supply voltage when Q11 and Q12 are not conducting. This is less positive than the bases of Q11 and Q12 and represents reverse

bias. At a load current of 100 milliamperes CR6 has about 1-volt drop and its forward resistance is on the order of 10 ohms which is low enough to be negligible. Power line filtering is provided by inductor L2 and capacitor C38 which is effective with ripple frequencies as low as 120 cps and up to one volt rms.

CHAPTER 3

TROUBLE SHOOTING

Section I. TEST EQUIPMENT AND FACILITIES REQUIRED

14. Test Equipment Required

The equipment required for locating trouble and for performing alignment procedures are listed in the following chart with the associated technical manuals and the assigned common names.

Test Equipment

Test Equipment	Technical Manual	Common Name
Signal Generator TS-497( )/U	TM 11-5030A	Signal Generator
Signal Generator AN/URM-25	Navships 92495	Signal Generator
Output Meter TS-585( )/U	TM 11-5017	Output Meter
Electronic Multimeter TS-505( )/U	TM 11-5511	Vtvm

15. Facilities

Test procedures will be facilitated if a bench test set-up is available that approximates an installation that includes a 27.5-volt d-c power supply and an Indicator Light Assembly SC17810-4. This will facilitate application of power for stage gain checks and alignment procedures. The set-up should provide access to the top and bottom of the chassis to allow complete testing of the unit. Top and bottom covers may be removed by loosening the screws holding the covers in place and sliding them off the assembly.

Section II. TROUBLE SHOOTING TECHNIQUES

16. Trouble Localization

The tests listed below will aid in isolating trouble to a single stage or circuit and then locate the trouble within the circuit by voltage, resistance, and continuity measurements.

17. Visual Inspection

Visually inspect all soldered joints for poor contact or cold solder. Any connections which appear to be cold soldered should be touched up with a soldering iron. Make sure all transistors are firmly mounted in their sockets. Check all diodes for cracked glass shell or loose end connection. Connect the unit into the bench test set-up and switch on the power. Prod all connections or components gently with a non-metallic probe. Any sudden change in output may indicate the source of trouble.

18. Transistor Check

a. Switch power off and carefully remove one transistor at a time. Test each transistor with the Transistor Test Set. Return operable transistors to the chassis and replace those which are questionable with a transistor known to be good. In the absence of a test set, employ a substitution procedure.

b. In case of a completely inoperative unit, replace Q1 (TAE 1629) or Q2 (2N247) with new transistors. This may cause the two oscillators to become operative. Exhange Q2 with similar type (2N247) transistors such as Q3 and check operation. Replacement of Q1 may require alignment of T8 as described in paragraph 26.

19. D.C. Voltage Measurements

a. Without Input Signal. Switch the unit on and with no signal input to the antenna terminal and d-c input voltage at exactly 27.5 volts, measure the voltage between the test points shown on figure 2 and ground. They should be within 15 percent of the values given in the voltage chart. If any major differences are noted, perform a resistance check as described in paragraph 20. Refer to figures 2 and 4 for test point locations.

b. With Input Signal. If all no-signal d-c voltages are correct, apply a 75-megacycle input signal of 50,000 microvolt amplitude, modulated 30 percent at 400 cycles per second to antenna input terminal. Repeat all voltage measurements as listed in the voltage chart. Should deviations greater than 15 percent be found, apply a resistance check as described in paragraph 20 to locate the defective part.

(PART II)

D.C. VOLTAGE MEASUREMENTS

Conditions of Test

1. Measurements made from test point to ground using Electronic Multimeter TS-505/U
2. Sensitivity control at maximum
3. Tolerance ±15 percent

NO SIGNAL INPUT

Transistor Q	Transistor Type	Function	Test Point (Collector)	Voltage	Test Point (Base)	Voltage	Test Point (Emitter)	Voltage
1	TAE 1629	70.8 MC Oscillator	A	0	B	16	C	15.9
2	2N247	Converter	D	0	E	14.2	F	14.3
3	2N247	First I.F. Amplifier	G	0	H	7.8	J	7.9
4	2N247	Second I.F. Amplifier	R	0	K	7.7	L	7.8
5	2N247	Third I.F. Amplifier	M	0	N	13.7	P	13.9
6	2N270	First Audio Amplifier	S	6.8	T	10.8	U	10.9
7	2N270	Second Audio Amplifier	W	1.7	V	12.5	X	12.7
8	2N270	A.G.C. Amplifier	Z	7.7	Y	22.0	AA	22.0
9	2N269	Light Switch Shaping	AD	21.2	AC	27.3	AB	27.3
10	2N269	Light Switch Shaping	AE	27.5	AH	27.4	AF	27.3
11	2N270	Light Switch Output	AK	0	AJ	27.5	AG	27.1
12	2N270	Light Switch Output	AL	0	AM	27.5	AN	27.1

D.C. VOLTAGE MEASUREMENTS (Continued)

50,000 UV SIGNAL MODULATED 30% AT 400 CPS

Transistor Q	Transistor Type	Function	Test Point	Voltage	Test Point	Voltage	Test Point	Voltage
			Collector		Base		Emitter	
1	TAE 1629	70.8 MC Oscillator	A	0	B	16	C	15.9
2	2N247	Converter	D	0	E	14.2	F	14.2
3	2N247	First I.F. Amplifier	G	0	H	14.5	J	14.5
4	2N247	Second I.F. Amplifier	R	0	K	14.5	L	14.5
5	2N247	Third I.F. Amplifier	M	0	N	13.6	P	13.8
6	2N270	First Audio Amplifier	S	6.8	T	10.4	U	11.0
7	2N270	Second Audio Amplifier	W	1.45	V	13.5	X	13.2
8	2N270	A.G.C. Amplifier	Z	14.7	Y	20.0	AA	20.3
9	2N269	Light Switch Shaping	AD	27.3	AC	27.1	AB	27.5
10	2N269	Light Switch Shaping	AE	25.0	AH	27.5	AF	27.5
11	2N270	Light Switch Output	AK	26.1	AJ	25.0	AG	27.1
12	2N270	Light Switch Output	AL	26.1	AM	25.0	AN	27.1

20. Resistance Measurements

Disconnect the unit and remove all transistors. Make a point to point resistance check in accordance with the sequence shown on the resistance chart. Major deviations from values given in the chart should be checked by removing components in the circuits involved and checking them separately.

RESISTANCE MEASUREMENTS

Conditions of Test

1. Resistances in ohms
2. All transistors removed
3. Tolerance ±15 percent
4. Measurements made with Electronic Multimeter TS-505/U

NOTE. When resistance values include the resistance of a diode, they may disagree with the table values somewhat because of the difference in the ohmmeter being used.

Transistor Sockets	Test Points		Resistance Ohms
	from	to	
X1	A collector	ground	0
	C Emitter	ground	4900
	B Base	ground	5100
	B Base	C Emitter	6100
X2	D collector	ground	4.4
	F Emitter	ground	21,000
	E Base	ground	8000
	E Base	F Emitter	27,000
X3	G collector	ground	12
	J Emitter	ground	10,000
	H Base	ground	11,000
	H Base	J Emitter	21,000
X4	R collector	ground	13.2
	L Emitter	ground	10,000
	K Base	ground	11,200
	K Base	L Emitter	21,000
X5	M collector	ground	14
	P Emitter	ground	8400
	N Base	ground	6200
	N Base	P Emitter	13,000
X6	S collector	ground	950
	U Emitter	ground	3400
	T Base	ground	4400
	T Base	U Emitter	6300
X7	W collector	ground	300 14
	X Emitter	ground	3600 8400
	V Base	ground	3000 6200
	V Base	X Emitter	4800 13,000

RESISTANCE MEASUREMENTS (Continued)

Transistor Sockets	Test Points		Resistance Ohms
	from	to	
X8	Z collector	ground	4100
	AA Emitter	ground	2600
	Y Base	ground	7500 = 4000
	Y Base	AA Emitter	8000 5000
	Y Base	Z collector	12,000
X9	AD collector	ground	1900
	AB Emitter	ground	1700
	AC Base	ground	3700
	AC Base	AB Emitter	2000
X10	AE collector	ground	5200
	AF Emitter	ground	1700
	AH Base	ground	1700
	AH Base	AF Emitter	240
X11	AK collector	ground	-
	AG Emitter	ground	-
	AJ Base	ground	5200 5600
	AJ Base	AG Emitter	
X12	AL collector	ground	-
	AN Emitter	ground	3400
	AM Base	ground	5200
	X11E	X12E	23
	X11C	Pin 9	0
	X7E	Pin 3	2100
	X5E	Pin 3	7000
	X6E	Pin 3	2000
	X8C	X4B	7000
	X8C	X4E	13,800

21. Signal Tracing

a. Certain types of trouble which can render the unit inoperative cannot be located by a voltage or resistance check. In these cases it will be necessary to employ signal tracing techniques.

b. Connect the signal generator through a 0.01 mfd capacitor to test point M, collector pin C of Q5 and ground. Connect the output meter to the N Base

audio output jack on the test panel. Set the signal generator for a 520-kc output, modulated 30 percent at 400 cycles. Increase the output of the signal generator to 364 microvolts. With the sensitivity control and audio attenuator switch set for maximum output, the output meter should indicate approximately five milliwatts. This checks the detector and audio portions of the unit.

c. Repeat this process using the following signal tracing chart as a guide. The audio output in each case should be about five milliwatts.

SIGNAL TRACING CHART

Sequence	Signal Generator		Frequency	Output Microvolts	Section Checked (Progressive)
	Input Point				
	Test Point	Item			
1	M	Q5 - Collector	520 kc	364	Det. and Audio
2	K	Q4 - Base	520 kc	350	2nd and 3rd I.F.
3	H	Q3 - Base	520 kc	44	1st I.F.
4	F	Q2 - Emitter	520 kc	17	T9, T10, T11
5	F	Q2 - Emitter	4.2 mc	12	osc-converter
6	-	T5-4	4.2 mc	158	T5, T6, T7
7	-	T4-3	75 mc	90	70.8 mc. osc.

NOTE

If the printed circuit board and the components are covered with a moisture proofing varnish, it is necessary to puncture this varnish with a test probe to make contact. On completion of repairs and tests, recoat as described in paragraph 22h.

CHAPTER 4

REPAIRS AND ALIGNMENT

Section I. REPAIRS

22. Specialized Techniques

Repairing this receiver requires a number of special techniques listed below under appropriate headings:

a. Removal of Receiver from Case. Most repairs and adjustments can be made by removing the receiver from the case only. Remove the four screws on the rear of the receiver and slide the top and bottom covers off the receiver. The interior of the receiver, top and bottom are exposed.

b. Removal of Receiver Front Panel. Remove cover as indicated in paragraph a. Remove the four screws and lockwashers, two on each side, that hold the panel to the metal wraparound or frame. Remove screw holding bracket of front panel to printed circuit board and unsolder wires from S1.

c. Removal of Receiver from Wraparound or Frame. Remove case and front panel and then the four screws, nuts, and lockwashers that fasten the board mounting brackets to the wraparound. Spring the wraparound gently and slide the printed board out. Be very careful in handling the receiver after removal from wraparound.

d. Removal of Socket Mounted Components. Transistors Q1 through Q9 are retained by sockets and may be removed by pulling directly away from the chassis. On replacing transistors Q1 and Q2, care must be exercised to see that they are properly oriented.

e. Replacing Diodes. When soldering or unsoldering diodes CR2 to CR6, clamp the lead between the component and the soldered point with a pair of long nosed pliers as a heat sink to prevent the heat damaging the component.

f. Removal of Soldered Components. Heat the soldered joint with a low-wattage iron (20 watts or less). Use the heat sparingly, applying the heat only long enough to melt the solder. At the instant the solder melts, remove the heat and brush the solder away with a stiff bristled brush (an office paste brush will do). Repeat until joint is free of excess solder. Allow a cooling interval between each application of heat to prevent the printed wire bond from breaking. Gently wiggle lead until it breaks loose. Uncrimp wire and remove component.

g. Installing Soldered Component. Insert component leads in holes and press component tight to board. Cut and crimp the leads and solder in place. Apply heat and solder sparingly to complete the job.

h. Restoring Protective Coating. If the unit employs a coating, on completion of repairs and tests, coat the new components and places where the coating was damaged with Shell Epon 815 and catalyst to give moisture and humidity protection. Brush the resin on the exposed areas and cure at 70 degrees Centigrade for at least two hours, longer if possible.

Section II. ALIGNMENT PROCEDURES

23. General

Alignment is required for the three band-pass filters and the high-frequency oscillator. The three second i-f transformers T12, T13 and T14 are untuned and require no realignment. When the entire receiver is being realigned, follow the procedures in the order given. Otherwise, use only that portion of the alignment procedure required.

24. Second I-F Filter

a. Set the audio attenuator to maximum output and the sensitivity control maximum clockwise. Connect an audio output meter TS-585/U to the receiver audio output and set the meter for a 150-ohm load and to read five milliwatts output.

b. Connect signal generator AN/URM-25 tuned to 520 kilocycles, modulated 30 percent at 400 cycles to the emitter of Q2 (test point T7-3) through a 100-mmfd coupling capacitor.

c. Connect a 470-ohm 1/2-watt, composition loading resistor across the tuned primary winding of T11 and across T10. Adjust signal generator output for a five-milliwatt reading on the audio output meter.

d. Resonate transformer T9.

e. Transfer the 470-ohm resistor across transformer T10 to transformer T9 and resonate transformer T10.

f. Transfer the 470-ohm resistor across transformer T11 to transformer T10 and resonate transformer T11.

g. An adjustment of the signal generator level may be required during the adjustment procedure to keep the output level at five milliwatts.

h. Check the alignment by removing the two loading resistors and adjusting the signal generator level for five milliwatts output. Double the signal generator output and adjust signal generator frequency above and below 520 kilocycles until the output is again five milliwatts. The new frequencies should be 480 kilocycles or less and 560 kilocycles or more. Continue to 4.2-megacycle filter alignment.

25. First I-F Filter

a. Use the same audio output set-up as described in paragraph 24a. Connect signal generator TS-497/U to the high side of the coupling link in transformer T5, test point T5-4, through a 0.01 mfd capacitor. Set the signal generator frequency to 4.2 megacycles. Adjust the signal generator output for a reading of five milliwatts on the output meter.

b. Adjust transformers T5, T6 and T7, in the order given, for maximum reading on the audio output meter. Adjust signal generator output as required to keep reading approximately five milliwatts.

26. High Frequency Oscillator Alignment

a. Connect signal generator TS-497/U to antenna J1 of Radio Receiver R-737( )/ARN with the latter connected to the bench test set-up. Set the generator for 75 megacycles, modulated 30 percent at 400 cycles. Set level of generator output to 2000 microvolts. Connect audio output meter TS-585/U to receiver audio output and set meter for 150-ohm load and to read five milliwatts output.

b. Switch on equipment and adjust the core of T8 until an audio output is observed. Rotate core adjustment clockwise toward maximum inductance until the audio output drops off abruptly. This indicates oscillations have ceased.

c. Rotate core adjustment counterclockwise slowly until output reappears. Continue to rotate core one complete turn. This represents the point of maximum output and stability. Oscillator adjustment is now complete.

27. Radio Frequency Preselector

a. Use the same audio output set-up as in paragraph 26. Connect signal generator AN/URM-25 to the antenna jack J1. Set signal generator to 75 megacycles, modulated 30 percent at 400 cycles. Check 27.5-volt supply voltage. Adjust the signal generator output to give a five-milliwatt indication on the audio output meter. Adjust transformers T1, T2, T3 and T4 for maximum output. Adjust the signal generator output as required to keep the audio output at approximately five milliwatts.

b. After peaking transformers T1 to T4, rotate each core adjustment one-quarter turn counterclockwise. Audio output should not decrease more than one or two db. Alignment is now complete.

APPENDIX I. PARTS LIST

The following pages list the parts for the Radio Receiver R-737( )/ARN as a guide for procurement purposes

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504 REQ'D.	503 REQ'D.	502 REQ'D.	501 REQ'D.	ITEM OR SYMBOL	PART NUMBER	DESCRIPTION
			X	C1		CAPACITOR (PART OF T1)
			X	C2		CAPACITOR (PART OF T2)
			X	C3		CAPACITOR (PART OF T2)
			X	C4		CAPACITOR (PART OF T3)
			X	C5		CAPACITOR (PART OF T3)
			X	C6		CAPACITOR (PART OF T4)
			X	C7		CAPACITOR (PART OF T4)
			X	C8		CAPACITOR (PART OF T5)
			X	C9		CAPACITOR (PART OF T6)
			X	C10		CAPACITOR (PART OF T7)
			X	C11		CAPACITOR (PART OF T6)
			X	C12		CAPACITOR (PART OF T7)
			1	C13	8942053-104	CAPACITOR .01 UF 100 V ±20 %
			1	C14	8942053-4	CAPACITOR 0.01 UF 100 V ±20 %
			1	C15	8942053-1	CAPACITOR .001 UF 100 V ±20 %
			X	C16		CAPACITOR (PART OF T8)
			X	C17		CAPACITOR (PART OF T8)
			1	C18	8914319-334	CAPACITOR 270 UUF 500 V ±5 %
			X	C19		CAPACITOR (PART OF T9)
			X	C20		CAPACITOR (PART OF T10)
			X	C21		CAPACITOR (PART OF T9)
			X	C22		CAPACITOR (PART OF T10)
			X	C23		CAPACITOR (PART OF T11)
			1	C24	8942053-104	CAPACITOR .01 UF 100 V ±20 %
			1	C25	8942053-104	CAPACITOR .01 UF 100 V ±20 %
			1	C26	8412778-10	CAPACITOR 15 UF 20 V
			1	C27	8942053-104	CAPACITOR .01 UF 100 V ±20 %
			1	C28	8942053-104	CAPACITOR .01 UF 100 V ±20 %
			1	C29	8412778-10	CAPACITOR 15 UF 20 V
			1	C30	8942053-104	CAPACITOR .01 UF 100 V ±20 %
			1	C31	8942053-106	CAPACITOR .05 UF 100 V ±20 %
			1	C32	8942053-106	CAPACITOR .05 UF 100 V ±20 %
			1	C33	8817618-104	CAPACITOR 15 UF 15 V
			1	C34	8817618-104	CAPACITOR 15 UF 15 V
			1	C35	8412778-10	CAPACITOR 15 UF 20 V

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504 REQ'D.	503 REQ'D.	502 REQ'D.	501 REQ'D.	ITEM OR SYMBOL	PART NUMBER	DESCRIPTION
			1	C36	8817618-104	CAPACITOR 15UF 15V
			1	C37	8412778-10	CAPACITOR 15UF 20V
			1	C38	8908134-101	CAPACITOR 40UF 30V
SHA, TD	C41		1	C39	8412778-11	CAPACITOR 60UF 6V
			1	C40	8419206-1	CAPACITOR 1UF 24V
			1	C41	8412778-10	CAPACITOR 15UF 20V
			1	C42	8942053-1	CAPACITOR .001UF 100V ± 20%
			X	C43		CAPACITOR (PART OF T8)
			X	C44		CAPACITOR (PART OF T5)
			1	CR1	IN415B	DIODE
			1	CR2	8914131	DIODE TI 601
			1	CR3	IN198	DIODE
			1	CR4	8914131	DIODE
			1	CR5	IN198	DIODE
			1	CR6	8976179	DIODE PS 531

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504 REQ'D.	503 REQ'D.	502 REQ'D.	501 REQ'D.	ITEM OR SYMBOL	PART NUMBER	DESCRIPTION
			1	L1	359067	COIL 0.73 UH, Q=54
			1	L2	XT9997A	CHOKE 0.75 H, MIN. @ 35 MA.
			1	R1	990166-76	RESISTOR 15K OHMS 1/10 WATT ±10%
			1	R2	990166-70	RESISTOR 4.7K OHMS 1/10 WATT ±10%
			1	R3	990166-66	RESISTOR 2.2K OHMS 1/10 WATT ±10%
			1	R4	990166-62	RESISTOR 1000 OHMS 1/10 WATT ±10%
			1	R5	990166-82	RESISTOR 47K OHMS 1/10 WATT ±10%
			1	R6	990166-75	RESISTOR 12K OHMS 1/10 WATT ±10%
			1	R7	990166-77	RESISTOR 18K OHMS 1/10 WATT ±10%
			X	R8		RESISTOR (PART OF T9)
			X	R9		RESISTOR (PART OF T11)
			1	R10	990166-77	RESISTOR 18K OHMS 1/10 WATT ±10%
			1	R11	990166-72	RESISTOR 6.8K OHMS 1/10 WATT ±10%
			1	R12	990166-71	RESISTOR 5.6K OHMS 1/10 WATT ±10%
			1	R13	990166-74	RESISTOR 10K OHMS 1/10 WATT ±10%
			1	R14	990166-71	RESISTOR 5.6K OHMS 1/10 WATT ±10%
			X	R15		RESISTOR (PART OF T12)
			X	R16		RESISTOR (PART OF T12)
			1	R17	990166-71	RESISTOR 5.6K OHMS 1/10 WATT ±10%
			1	R18	990166-74	RESISTOR 10K OHMS 1/10 WATT ±10%
			1	R19	990166-71	RESISTOR 5.6K OHMS 1/10 WATT ±10%
			1	R20	990166-76	RESISTOR 15K OHMS 1/10 WATT ±10%
			1	R21	474878-10	RESISTOR VAR. 100K OHMS, 1/3 WATT, ±10%
			1	R22	990166-75	RESISTOR 12K OHMS, 1/10 WATT ±10%
			1	R23	990166-73	RESISTOR 8.2K OHMS 1/10 WATT ±10%
			1	R24	990166-72	RESISTOR 6.8K OHMS 1/10 WATT ±10%
			1	R25	990166-60	RESISTOR 680 OHMS, 1/10 WATT ±10%

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504 REQ'D.	503 REQ'D.	502 REQ'D.	501 REQ'D.	ITEM OR SYMBOL	PART NUMBER	DESCRIPTION
			X	R26		RESISTOR (PART OF T13)
			X	R27		RESISTOR (PART OF T14)
			1	R28	990166-68	RESISTOR 3.3K OHMS 1/10 WATT ±10%
			1	R29	990166-72	RESISTOR 6.8K OHMS 1/10 WATT ±10%
			1	R30	990166-73	RESISTOR 8.2K OHMS 1/10 WATT ±10%
			1	R31	990166-65	RESISTOR 1.8K OHMS 1/10 WATT ±10%
			1	R32	990166-59	RESISTOR 560 OHMS 1/10 WATT ±10%
			1	R33	990166-84	RESISTOR 68K OHMS 1/10 WATT ±10%
			1	R34	990166-72	RESISTOR 6.8K OHMS 1/10 WATT ±10%
			1	R35	990166-62	RESISTOR 1000 OHMS 1/10 WATT ±10%
			1	R36	990166-69	RESISTOR 3.9K OHMS 1/10 WATT ±10%
			1	R37	990166-58	RESISTOR 470 OHMS 1/10 WATT ±10%
			1	R38	990166-58	RESISTOR 470 OHMS 1/10 WATT ±10%
			1	R39	990166-70	RESISTOR 4.7K OHMS 1/10 WATT ±10%
			1	R40	990166-70	RESISTOR 4.7K OHMS 1/10 WATT ±10%
			1	R41	990166-49	RESISTOR 82 OHMS 1/10 WATT ±10%
			1	R42	990166-65	RESISTOR 1.8K OHMS 1/10 WATT ±10%
			1	R43	990166-48	RESISTOR 68 OHMS 1/10 WATT ±10%
			1	R44	990166-52	RESISTOR 150 OHMS 1/10 WATT ±10%
			1	R45	990166-57	RESISTOR 390 OHMS 1/10 WATT ±10%
			1	R46	990166-48	RESISTOR 68 OHMS 1/10 WATT ±10%
			1	R47	990166-45	RESISTOR 39 OHMS 1/10 WATT ±10%
			1	R48	990166-43	RESISTOR 27 OHMS 1/10 WATT ±10%
			1	R49	990166-55	RESISTOR 270 OHMS 1/10 WATT ±10%
			1	R50	990166-43	RESISTOR 27 OHMS 1/10 WATT ±10%
			1	R51	990166-54	RESISTOR 220 OHMS 1/10 WATT ±10%
			1	R52	722300-69	RESISTOR 3.9K OHMS 1/4 WATT ±10%
			1	R53	990166-62	RESISTOR 1000 OHMS 1/10 WATT ±10%
			1	R54	722300-71	RESISTOR 5.6K OHMS 1/4 WATT ±10%
			1	R55	722300-38	RESISTOR 10 OHMS 1/4 WATT ±10%
			1	R56	722300-38	RESISTOR 10 OHMS 1/4 WATT ±10%
			X	R57		RESISTOR PART OF ITEM-4
			X	R58		RESISTOR PART OF ITEM-4
			X	R59		RESISTOR PART OF ITEM-4

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			1	RT1	9843959-2	RESISTOR (NEG. TEMP. COEFF) 1130 OHMS
			1	RT2	9843959-2	RESISTOR (NEG. TEMP. COEFF) 1130 OHMS
			1	T1	359069-A	TRANSFORMER 75 MC
			1	T2	359069-B	TRANSFORMER 75 MC
			1	T3	359069-B	TRANSFORMER 75 MC
			1	T4	359069-C	TRANSFORMER 75 MC
			1	T5	358650-A	TRANSFORMER 4.2 MC
			1	T6	358650-B	TRANSFORMER 4.2 MC
			1	T7	358650-C	TRANSFORMER 4.2 MC
			1	T8	359068	TRANSFORMER 70.8 MC
			1	T9	358651-A	TRANSFORMER 520 KC
			1	T10	358651-B	TRANSFORMER 520 KC
			1	T11	358651-C	TRANSFORMER 520 KC
			1	T12	358652-A	TRANSFORMER 520 KC
			1	T13	358652-B	TRANSFORMER 520 KC
			1	T14	358662	TRANSFORMER 520 KC
			1	T15	XT9813-A	TRANSFORMER, AUDIO

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TITLE

COMPONENT BOARD

MARKER BEACON RECEIVER

RADIO CORPORATION OF AMERICA
CAMDEN, N. J.

CAMDEN PLANT

DWG. NO. 8703625 — REV.

SHEET 6 — RCA DIST.

RCA-536/11-55 1000 PRINTED IN U. S. A.

J. H. WEIL & CO., PHILA. #84N

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REV.	REVISION DESCRIPTION	DATE	APPROVAL	REV.	REVISION DESCRIPTION	DATE	APPROVAL

504 REQ'D.	503 REQ'D.	502 REQ'D.	501 REQ'D.	ITEM OR SYMBOL	PART NUMBER	DESCRIPTION
			1	XQ1	8415488-2	SOCKET-TRANSISTOR
			1	XQ2	8415488-3	SOCKET-TRANSISTOR
			1	XQ3	8415488-3	SOCKET-TRANSISTOR
			1	XQ4	8415488-3	SOCKET-TRANSISTOR
			1	XQ5	8415488-3	SOCKET-TRANSISTOR
			1	XQ6	8415488-4	SOCKET-TRANSISTOR
			1	XQ7	8415488-4	SOCKET-TRANSISTOR
			1	XQ8	8415488-4	SOCKET-TRANSISTOR
			1	XQ9	8415488-5	SOCKET-TRANSISTOR
			1	XQ10	8415488-5	SOCKET-TRANSISTOR
			1	XQ11	8415488-4	SOCKET-TRANSISTOR
			1	XQ12	8415488-4	SOCKET-TRANSISTOR
			1	Y1	8946889-1	CRYSTAL 70.3 MC
			1	Y2	8946888-1	CRYSTAL 4.72 MC

DWG. A SIZE

REVISION CODE — RCA USE

COMP. BY C.J. Mattison — DATE 23 JULY 1957

CHECKER

ENGINEER

LIST OF MATERIAL

TITLE

COMPONENT BOARD

MARKER BEACON RECEIVER

RADIO CORPORATION OF AMERICA
CAMDEN, N. J.

CAMDEN PLANT

DWG. NO. 8703625 — REV.

SHEET 7

RCA DIST.

RCA-536/11-55 1000 PRINTED IN U. S. A.

J. H. WEIL & CO., PHILA. #94M

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REV.	REVISION DESCRIPTION	DATE	APPROVAL	REV.	REVISION DESCRIPTION	DATE	APPROVAL

504 REQ'D.	503 REQ'D.	502 REQ'D.	501 REQ'D.	ITEM OR SYMBOL	PART NUMBER	DESCRIPTION
			X	1	8703625-501	COMPONENT BOARD
		X		2	8415446-501	RESISTOR BOARD
			1	3	8415447-1	BOARD-PRINTED CIRCUIT
		1		4	8946881-1	BOARD-PRINTED CIRCUIT, RESISTOR
			1	5	8946839-1	BLOCK-MOUNTING-Resistor Board
			2	6	8946829-1	CLAMP-CRYSTAL
			2	7	8946828-1	SPACER-CHOKE
			SET	8	PS-105-26	WIRE-TINNED, COPPER .0159 DIA X LG.
				9		
			1	10	8926618-1	SPACER-CAPACITOR (C38)
			3	11	8926618-9	SPACER-CAPACITOR (C33)
			2	12	8946841-1	CLIP-RETAINER, DIODE
			2	13	99105-155	RIVET, TUBULAR .059 DIA X .12 LG.
			SET	14	PS-164	SOLDER, SN60 ROSIN CORE, 60/40, QQ-S-571G
			X	15	644823	PHOTOMASTER-MAIN BOARD
		X		17	8703641	PHOTOMASTER-RESISTOR BOARD
		X	X	18		SCHEMATIC
		X	X	19	96404	SPECIFICATION WORKMANSHIP

DWG. A SIZE

COMP. BY C.J. Mattison — DATE 23 JULY 1957

CHECKER

ENGINEER

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COMPONENT BOARD

MARKER BEACON RECEIVER

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CAMDEN, N. J.
CAMDEN PLANT

DWG. NO. 8703625 — REV.

SHEET 2 OF 8 — RCA DIST.

RCA-536/11-55 1000 PRINTED IN U. S. A. — J. H. WEIL & CO., PHILA. #94M

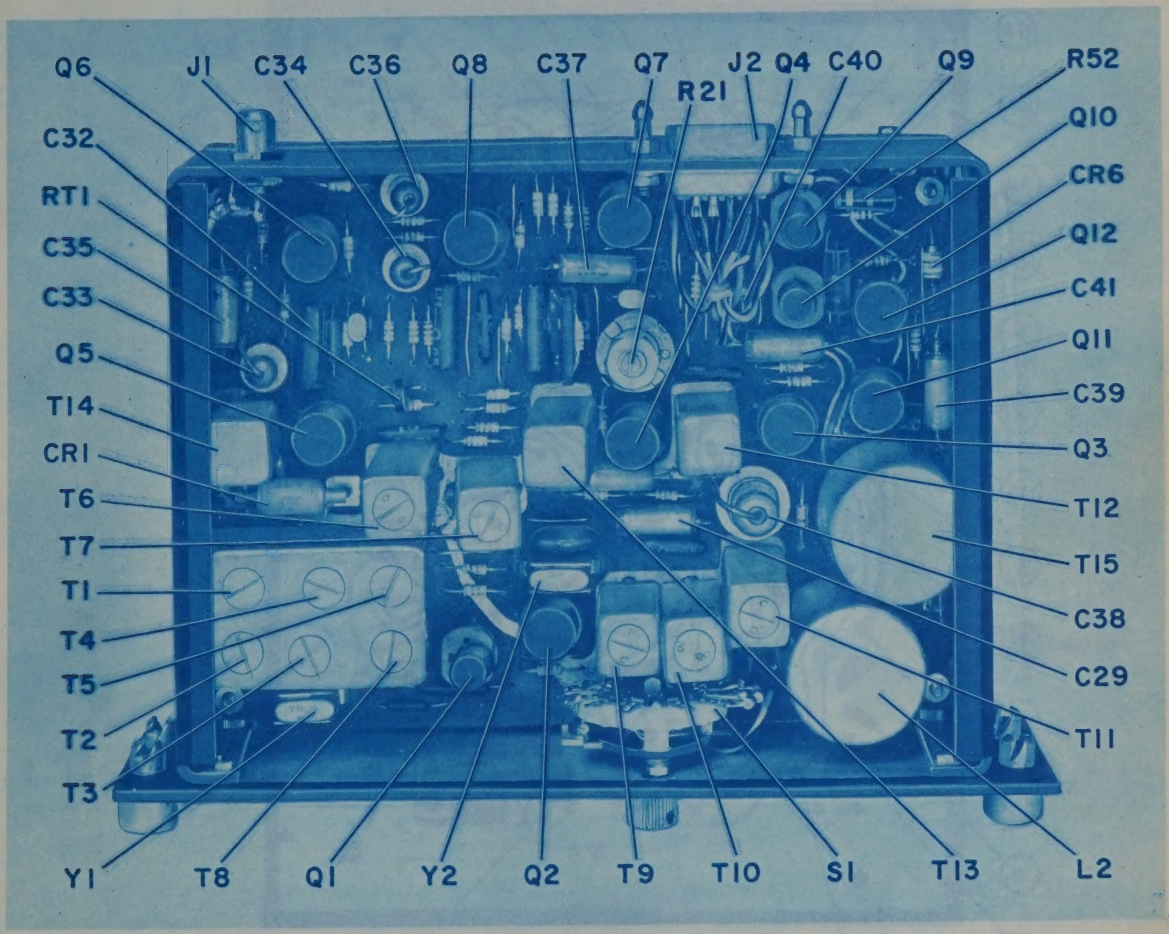


Figure 1. Radio Receiver R-737( )/ARN, top view, cover removed

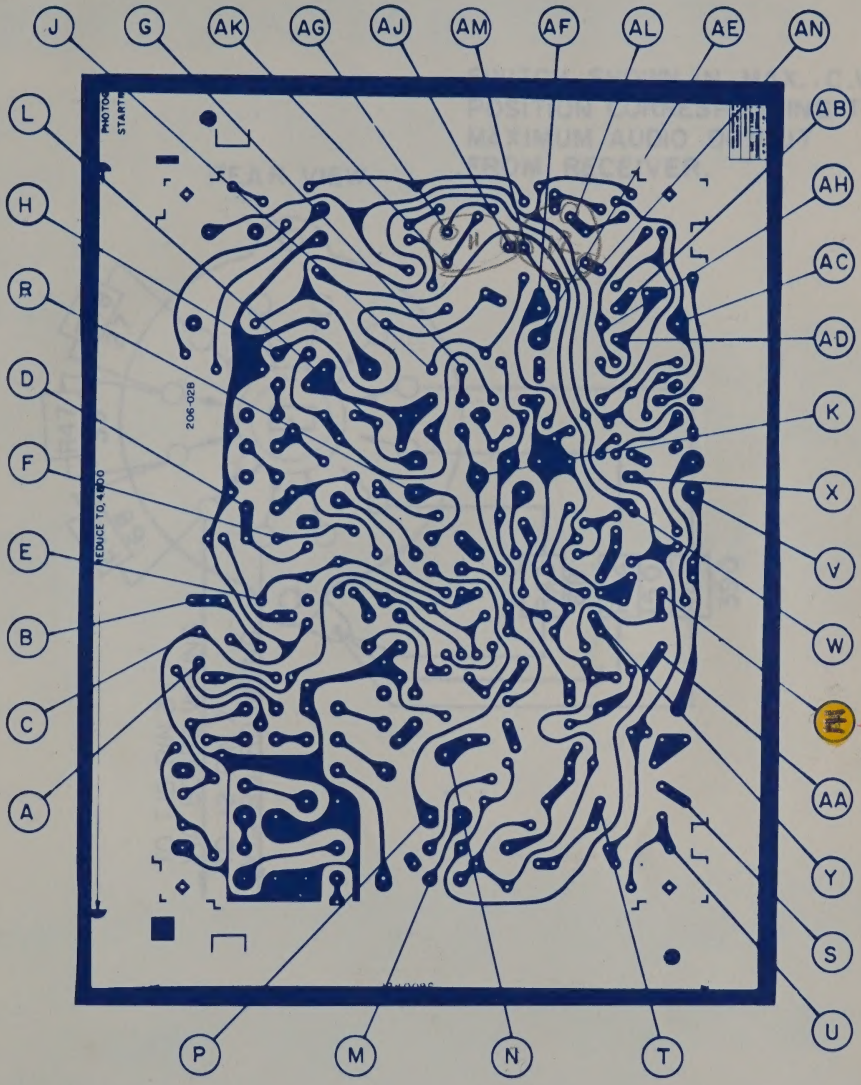


Figure 2. Test point diagram

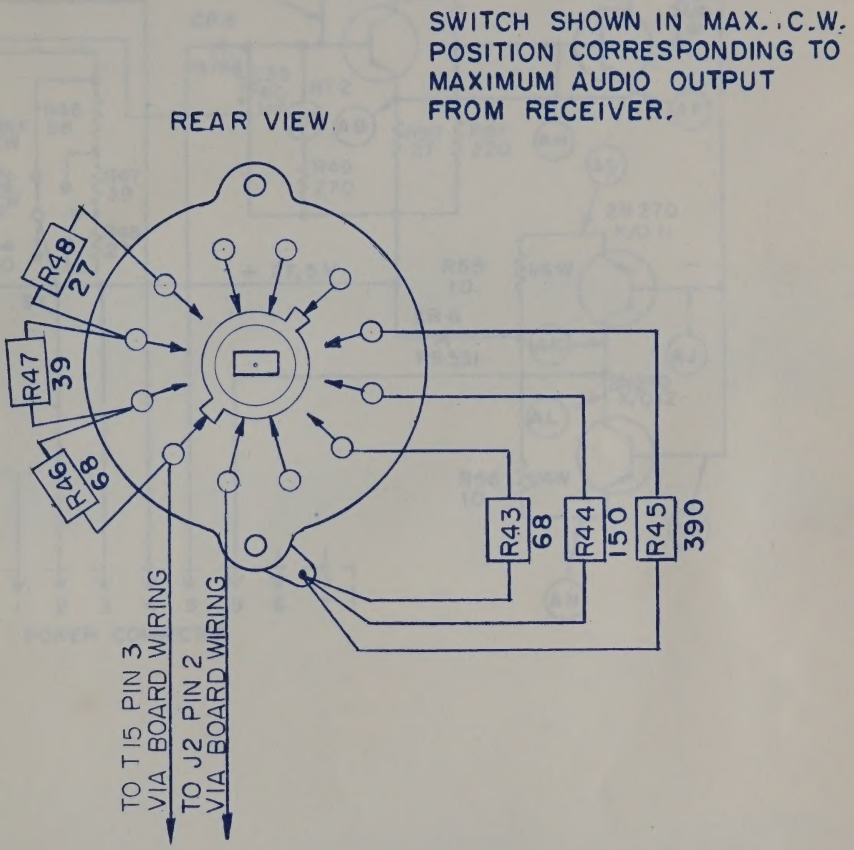
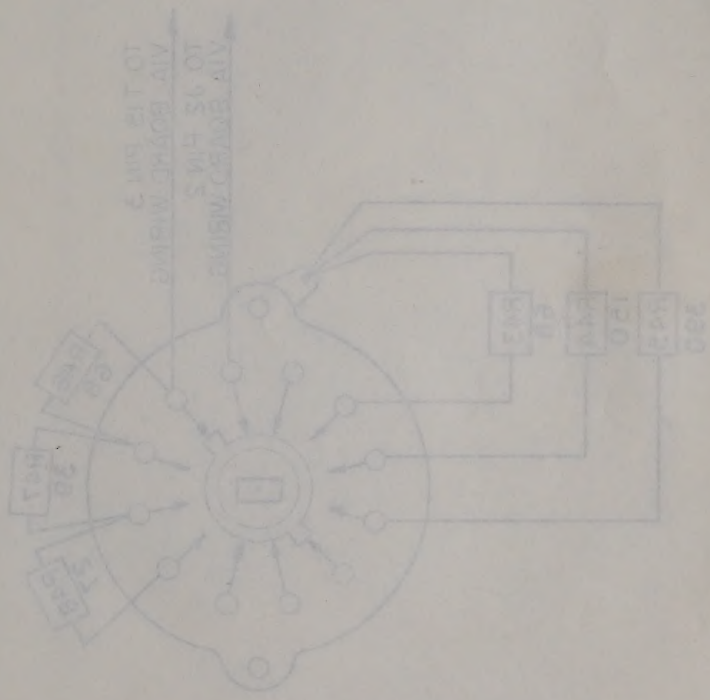


Figure 3. Attenuator switch, connection diagram



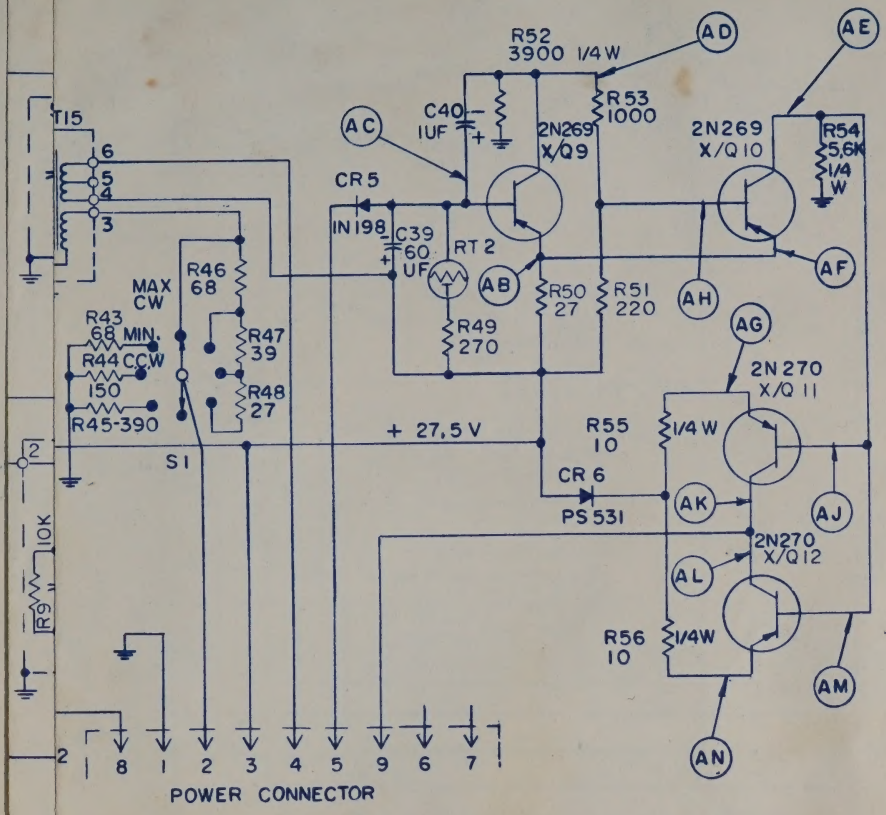
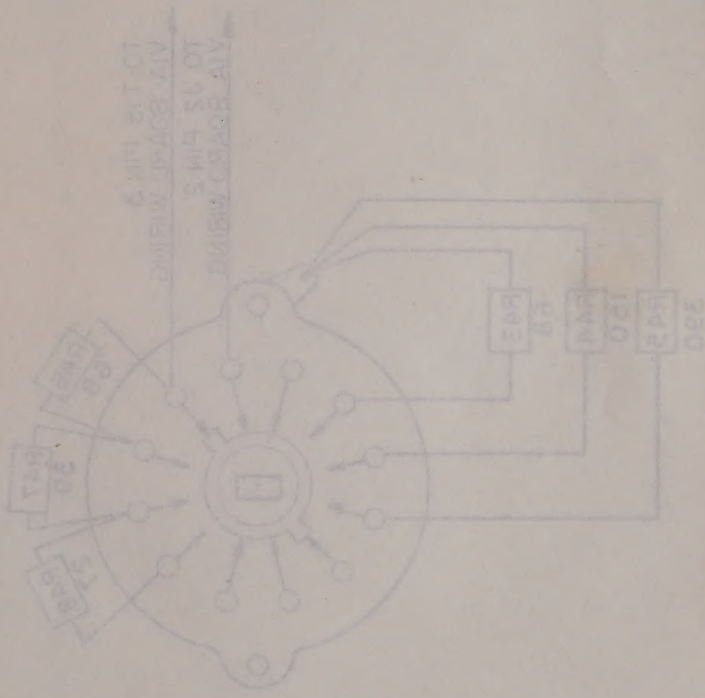
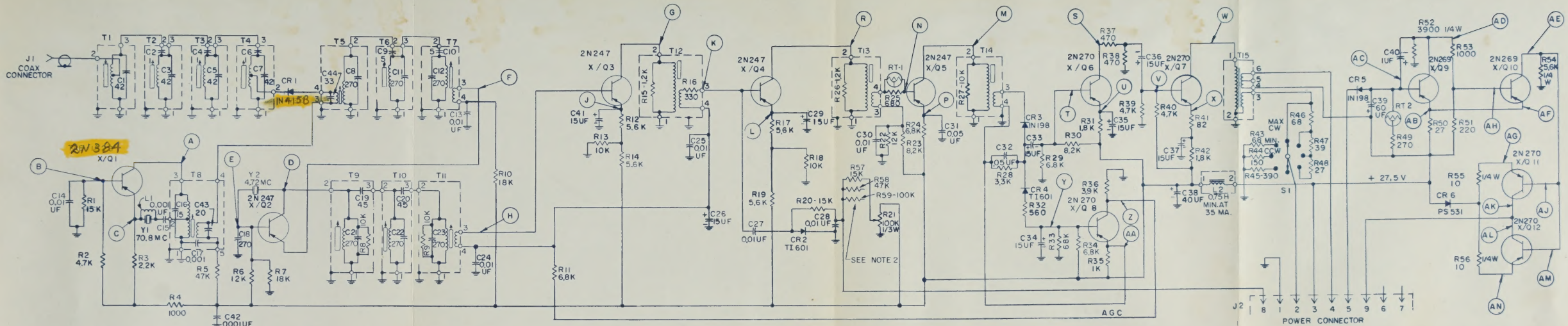
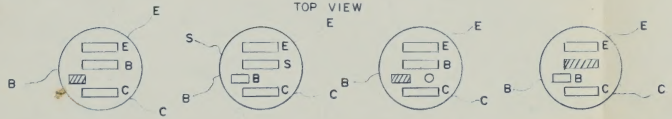


Figure 4. Radio Receiver R-737( )/ARN, schematic diagram





SOCKET LAYOUT
TOP VIEW

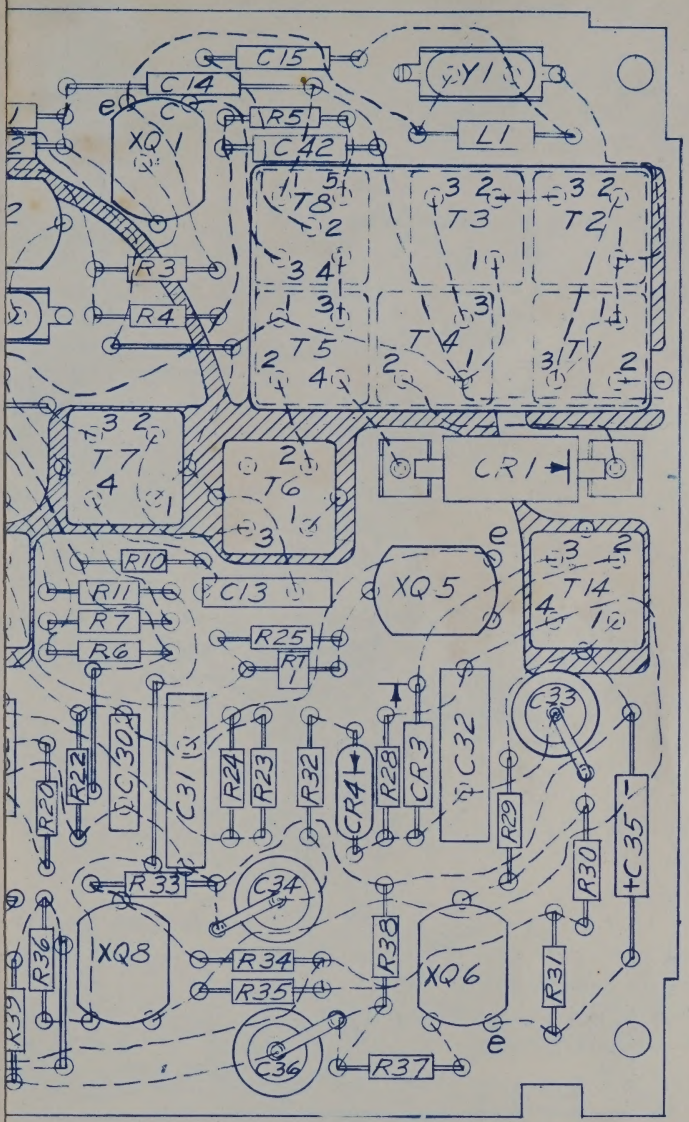


NOTES:

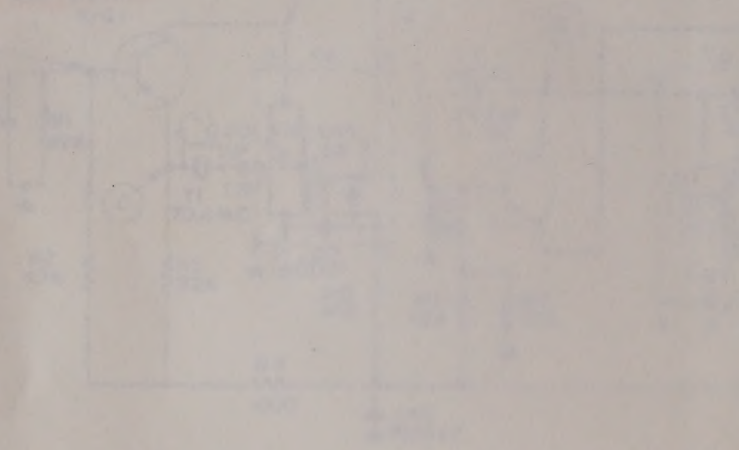
1: AUDIO ATTENUATOR SWITCH SHOWN IN C.W. POSITION MAXIMUM AUDIO OUTPUT.

2- R21 IS CONNECTED TO EITHER R57, R58 OR R59 BY JUMPER LEAD.

Figure 4. Radio Receiver R-737( )/ARN, schematic diagram



igure 5. Radio Receiver R-737( )/ARN, wiring diagram



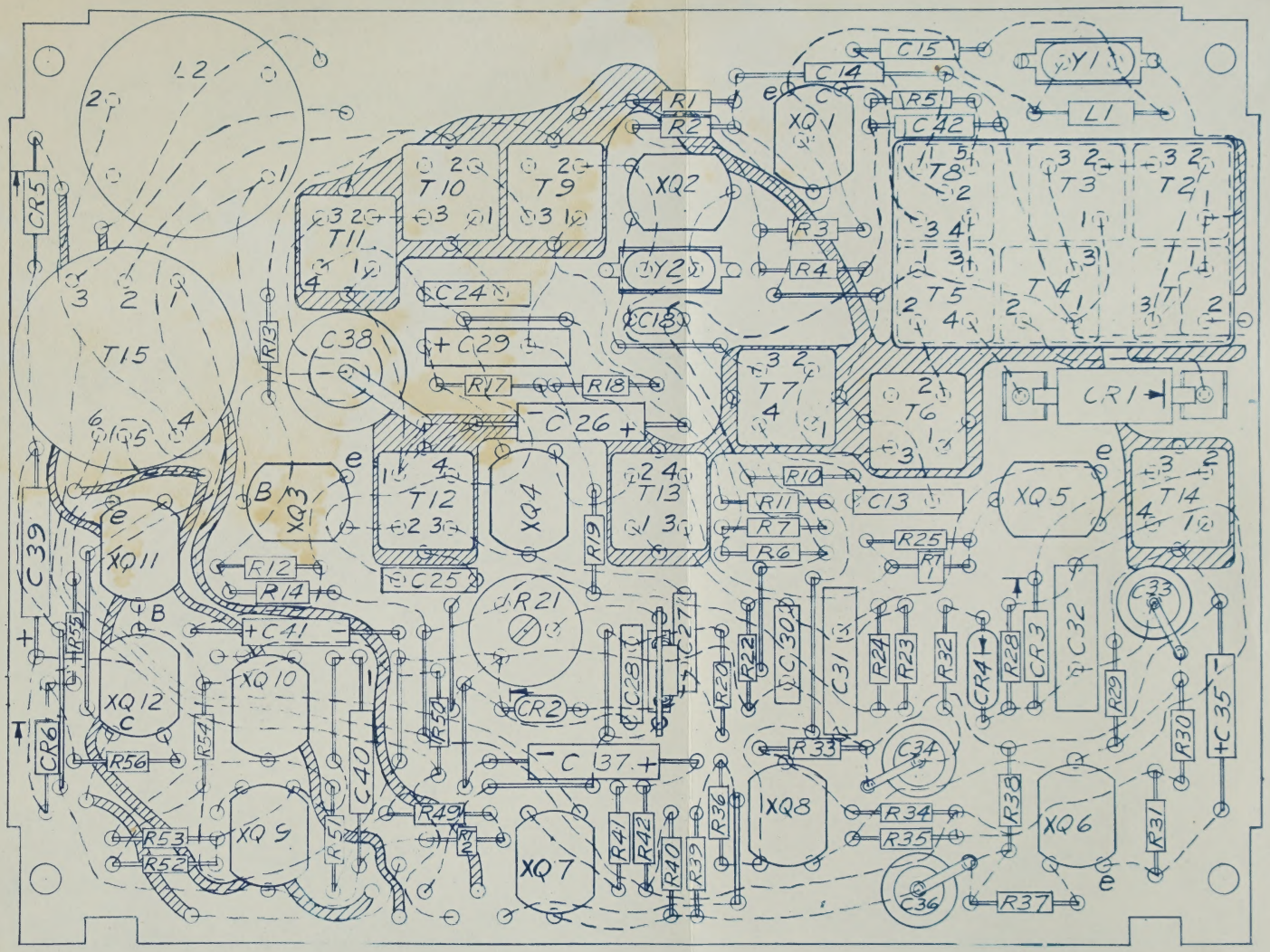


Figure 5. Radio Receiver R-737( )/ARN, wiring diagram